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### Original Article

## Does Theorizing on Reciprocal Altruism Apply to the Relationships of Individuals with a Spinal Cord Injury?

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**Abstract:** From the perspective of reciprocal altruism, we examined the role of reciprocity in the close relationships of people inflicted with a spinal cord injury (SCI) ( $n = 70$ ). We focused on the help receiver rather than on the help giver. Participants perceived more reciprocity in relationships with friends than in relationships with the partner and with family members. In these last relationships, perceptions of indebtedness were more prevalent than perceptions of deprivation. However, most negative feelings were evoked by a lack of reciprocity in partner relationships, followed by family relationships, and next by friendships. Moreover, depression was especially associated with a lack of perceived reciprocity in the relationships with family, and somewhat less with a lack of perceived reciprocity in the relationship with the partner. These results underline the importance of reciprocity in relationships, but suggest that reciprocity may be more, rather than less important in partner and family relationships.

**Keywords:** reciprocity, spinal cord injury, depression

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### Introduction

The notion that reciprocity is a crucial feature of human social relationships is manifest in the work of a large number of behavioral and social scientists. In his book on human universals, Brown (1991) noted that among anthropologists "reciprocity has long been recognized as a universal cornerstone of morality, rational choice, and group life" (pp. 107-108). Political scientists have shown that reciprocal behavioral strategies may lead in the long run to the highest level of outcomes (Axelrod, 1984). Marital therapists have developed programs aimed at increasing the awareness of reciprocity and at establishing reciprocal exchanges of rewarding behaviors (Liberman, Wheeler, deVisser, Kuehnel, and Kuehnel,

1980). Within social psychology, especially equity theorists have emphasized that individuals prefer reciprocity in their relationships (Walster, Walster, and Berscheid, 1978), with a lack of reciprocity leading to negative emotions, distress, and health problems (e.g., Siegrist, 2009; Väänänen, Buunk, Kivimäki, Pentti, and Vahtera, 2005; Van Yperen and Buunk, 1994). Such notions and findings from the behavioral and social sciences do, as noted by Alexander (1979), converge with the predictions derived from an evolutionary view on social exchange, as well as with evidence from animal studies (cf. De Waal, 1996).

Evolutionary theorists consider reciprocity an important concept to explain the evolution of altruism, assuming that altruism can evolve when the costs of helping to help givers are lower than the benefits help givers may eventually obtain from their helping acts. A central assumption in this theorizing is that humans have evolved cognitive and emotional mechanisms to promote reciprocity, and therefore being the recipient of help will usually induce feelings of obligation and guilt (e.g., Cosmides and Tooby, 1992; Trivers, 1985; for a review, see Gintis, Bowles, Boyd, and Fehr, 2007). In the present study among individuals with a spinal cord injury (SCI), we examined to what extent considerations of reciprocity still play a role even in individuals who, given their condition, are usually highly dependent on others. Each year, a substantial number of people all over the world develop a spinal cord injury, usually as a result of a traffic accident. Sustaining a traumatic spinal cord injury (SCI) and becoming a paraplegic involves a major change in all aspects of one's life, making individuals more dependent on others and confronting them with the lifelong process of adapting to their physical disability (see Van Campen and Cardol, 2009). Especially depression has been found to be quite prevalent among people with SCI (Dias de Carvalho, Andrade, Tavares, and Sarmiento de Freitas, 1998; Fann et al., 2011), with figures as high as 21% in the first year and 18% in the fifth year (Hoffman, Bombardier, Graves, Kalpakjan, and Krause, 2011).

We examined perceptions of reciprocity in three types of relationships: partner relationships, family relationships, and friendships. According to De Waal (1996), it is quite possible that the trading of social services was already widespread in our primate ancestors before the exchange of food. When individuals become seriously ill, a change may occur in the balance of give-and-take of such services in their relationships (e.g., Cutrona, 1996). For example, individuals with SCI may feel that they are a burden to their partner, as the contributions of their partner and their family members increase (e.g., extra household chores, assistance with the patient's self-care and medical regimens, and providing emotional support), whereas patients' contributions usually decrease because of physical limitations and emotional turmoil (cf. Coyne, Wortman, and Lehman, 1988). From the perspective of reciprocal altruism, individuals would perceive themselves as indebted in such a situation. In line with this analysis, research has shown that cancer patients perceive themselves on average as indebted in their partner relationships compared to healthy individuals (Kuijer, Buunk, and Ybema, 2001). At the same, however, it is possible that individuals with SCI experience the opposite of indebtedness, i.e., deprivation, when they feel that, given their situation, they receive less in return from their relationship in comparison to what they invest in their relationship. This may occur, for instance, when one feels that one is doing what one can, but that the other person is not providing the help one deserves in one's situation as a paraplegic. Thus, the first question in the present

research was whether individuals perceived their close relationships as characterized by deprivation, reciprocity, or indebtedness.

*Perceptions of Reciprocity and Feelings in Response to Reciprocity*

In addition to perceptions of reciprocity, we were also interested in the feelings related to reciprocity. De Waal (1996) suggested that the actions of our ancestors were already guided by “human” emotions such as gratitude, obligation, retribution, and indignation, and Trivers (1985) pointed to the adaptive function of similar emotions as responses to altruistic and exploitative acts. In all cultures, strong moral feelings are attached to reciprocity and a lack thereof (Brown, 1991; Gintis et al., 2007). Therefore, a second question in the present study was how prevalent guilt, anger, sadness, gratitude, pride, and satisfaction were in the three types of relationships, and a third question was how these feelings were related to reciprocity perceptions. It can be predicted that, overall, in line with several studies among healthy people and people with health problems, those who perceive themselves in their relationships as indebted will experience more guilt and gratitude, those who perceive themselves as deprived will experience more anger and sadness, and those who perceive their relationships as reciprocal will experience more pride and satisfaction (e.g., Hassebrauck, 1986; Kuijer, Buunk, Ybema, and Wobbles, 2002; Sprecher and Schwartz, 1994; Walster et al., 1978).

*Reciprocity and Depression*

Many studies have shown that perceptions of reciprocity are related to well-being. Buunk and Schaufeli (1999) presented a review of research documenting the importance of reciprocity for various mental health outcomes, including burnout, loneliness, marital satisfaction, and depression, and for a wide variety of relationships, including marital relationships, friendships, professional-client relationships, and relationships with colleagues and supervisors. For instance, among cancer patients, the perception of indebtedness in one’s partner relationship has been found to be linked to depressive symptoms (Ybema, Kuijer, Buunk, DeJong, and Sanderman, 2001) and among healthy couples perceptions of deprivation as well as perceptions of indebtedness in one’s marital relationship have been found to be associated with depression (e.g., Longmore and Demaris, 1997). In addition, a longitudinal study among working adults in Finland showed that, over a five-year period, among women a change in reciprocity in partner relationships towards being a receiver of help predicted depression, whereas among men a change toward being the provider of help had a corresponding though less evident impact on depression (Väänänen, Buunk, Kivimäki, Vahtera, and Koskenvuo, 2008). Therefore, our fourth question was whether perceptions of deprivation as well as indebtedness do contribute to depression among individuals with SCI.

*Differences between the Three Types of Relationships*

It has often been argued that reciprocity will be a more important concern in friendships than in partner and family relationships, because altruistic acts in the latter type of bonds pay off in terms of the propagation of one’s genes, and not in terms of returned goods or services (e.g., Alexander, 1982). In line with the theory of reciprocal altruism, as

there are less barriers to break off friendships than to break off partner and family relationships, non-reciprocal friendships will more likely have been terminated, and reciprocity will therefore be relatively more prevalent in friendships (see Li, Fok, and Fung, 2011). However, while there is indeed evidence that a lack of reciprocity in friendships is related to a low well-being (Buunk and Prins, 1998), we would like to suggest that reciprocity may be an even more important concern in partner and family relationships than in friendships (cf. Stewart-Williams, 2007). Precisely because one is more dependent on one's family and partner and because it is relatively more difficult to break-off such relationships, a lack of reciprocity in such relationships will be more strongly related to negative feelings and to depression than in friendships.

### *Overview*

To summarize, in a sample of individuals with SCI, we examined reciprocity perceptions and reciprocity related feelings in three types of relationships, and related these perceptions and feelings to depression. We included people with various types of SCI as diagnosed by the physician, e.g., tetraplegia (sustained injuries in one of the eight cervical segments of the spinal cord), paraplegia (lesions in the thoracic, lumbar or sacral regions of the spinal cord), and various other injuries, including, among others, hemiplegia, spina bifida, and muscular dystrophy.

## **Materials and Methods**

### *Sample and Procedure*

The sample of this study ( $n = 70$ ) was randomly selected from the files of the Association of Persons with Spinal Cord Injury (ASPAYM) located in the Comunidad Valenciana in Spain. Of the original 300 persons selected, about 120 returned a mail questionnaire. Of the questionnaires, about 50 contained too many missing answers to be useful. The final sample consisted of 70 people with SCI, who all filled out the questionnaire themselves. Of these, 63% were male, and 37% were female, which is a similar gender distribution as that among people with SCI. Of the participants, 17.6% were classified as tetraplegics, 65.7% as paraplegics, and 14.7% as having other disabilities. The mean age was 43.97 ( $SD = 11.60$ ). Over half (52.2%) were married, 2.9% were widowed, 39.1% were single, and 5.8% were separated or divorced. Most (78.6%) had a SCI for 7 years or more, the others (21.4%) for 6 years or less. The educational level included no education (1.4%), elementary school (46.4%), high school (27.5%), and college or university (24.6%). A 31.3% were employed, 20.3% were unemployed, 43.4% was retired, and the others (14.1%) received disability financial support from government.

### *Instruments*

*Perceived reciprocity.* For each type of relationship, in line with Kuijer, Buunk, Ybema, and Wobbles (2002), four questions were asked about one's own and one's partner's contributions to and rewards from the relationship. The items were: "In general, how much do you contribute to your relationship?", "In general, how much does your partner contribute to your relationship", "In general, how much do you receive from your

relationship”, and “In general, how much does your partner receive from your relationship?” The items were measured on a 5-point scale, varying from 1 = “very little” to 5 = “very much.” Like in comparable research (see Buunk and Schaufeli, 1999), on the basis of these items, the degree of perceived reciprocity was calculated by the following formula:  $R = Ia/Oa - Ib/Ob$ , in which I = input, O = outcome, a = self, b = other. On the basis of this formula, the relationships of the participants were classified as characterized by either deprivation ( $R > 0$ ), reciprocity ( $R = 0$ ), or indebtedness ( $R < 0$ ). Because not all participants had a partner, we had data on reciprocity in partner relationships for only 45 (64%) of the participants.

*Reciprocity related feelings.* For each type of relationship, respondents were asked to rate on a 3-point scale (ranging from 1 = “not at all” to 3 = “somewhat applicable”) their feelings in response to the give-and-take in that relationship. The 12 feelings were reduced to six two-item scales on guilt, anger, sadness, gratitude, pride, and satisfaction, with the summed scores divided by two (cf. Sprecher and Schwartz, 1994; Walster et al., 1978).

*Depression.* This was measured with a subscale of the AIMS (Arthritis Impact Measurement Scales; Meenan, Gertman, and Mason, 1980) that has been validated in in a Spanish sample of people with SCI (González, Zurriaga, and Bravo, 1995). The scale had 11 items ( $\alpha = .95$ ) with answers for each statement on a 6-point scale (1 = “never” to 6 = “always”) indicating how often it occurred. Examples of items are: “During the past month, how much of the time have you felt tense?” and “During the past month, how much of the time have you been in low or very low spirits?”

### *Data Analysis*

Because of the small sample size, and the unequal distribution of people over various types of SCI, it was not feasible to use this variable in the analyses. The same was true for demographic variables such as educational level. However, we did examine if gender was related to the study variables, which proved hardly to be the case: A McNemar-Bowker test showed that there were no gender differences in the frequencies of the various types of reciprocity, all three  $X^2$ 's  $< 1.90$ ,  $p$ 's  $> .39$ . There was also no sex difference in depression,  $F(1, 64) = 1.34$ ,  $p = .252$ .

## **Results**

### *Degree of Perceived Reciprocity*

In the relationship with the partner, nearly as many people perceived indebtedness (42.2%) as reciprocity (44.4%), and deprivation (13.3%) was the least prevalent perception. Relationships with friends were clearly different: As expected, a large majority perceived reciprocity (70.3), and deprivation (17.2%) and indebtedness (12.5%) occurred about equally often. These differences between the relationship with the partner and relationships with friends were significant, according to a McNemar-Bowker test,  $X^2(3) = 12.25$ ,  $p = .007$ . Indebtedness (27.3%) was also more prevalent in relationships with family than deprivation (10.6%), but reciprocity (62.1%) was clearly the most prevalent perception here. However, the frequencies for family relationships did not differ significantly from those for the partner relationships,  $X^2(3) = 3.97$ ,  $p = .27$ , nor from those for the

relationships with friends,  $X^2(3) = 5.10, p = .16$ .

#### *Reciprocity Related Feelings*

We first examined how prevalent the six reciprocity related feelings were in the three types of relationships. We did a series of within-subjects ANOVAs with type of relationship (partner-family-friends) as the within-subjects factor, testing for the linear as well as quadratic trends. For all negative reciprocity related feelings, there was a significant overall effect, as well as a significant linear effect, for guilt, overall  $F(2, 35) = 5.06, p = .01$ , linear  $F(1, 36) = 9.43, p < .01$ , for anger,  $F(2, 33) = 4.86, p = .01$ , linear  $F(1, 34) = 9.90, p < .01$ , and for sadness,  $F(2, 35) = 4.19, p = .02$ , linear  $F(1, 36) = 6.65, p = .01$ . None of the quadratic trends were significant, all  $F$ 's  $< .71, p$ 's  $> .41$ . Thus, as expected, most guilt, anger, and sadness was experienced in partner relationships, followed by family relationships, with the lowest level of these feelings found in friendships. The positive reciprocity related feelings, i.e., satisfaction, pride and gratitude, did not differ between the three types of relationship, all  $F$ 's  $< 1.37, p$ 's  $> .26$ .

#### *Perceived Reciprocity as Related to Reciprocity Related Feelings*

To examine the relationship between perceived reciprocity and the various feelings, we executed ANOVAs with perceived reciprocity in each relationship type as the independent variable, and the six feelings as dependent variables.

As Table 1 shows, as expected, the most consistent effects on feelings were found for reciprocity in the relationship with the partner, with the effects on four feelings being significant. All effects were curvilinear, indicating that individuals perceiving reciprocity in this relationship reported more gratitude and satisfaction and less anger and sadness than those who perceived themselves as indebted, who, in turn reported more gratitude and satisfaction and less anger and sadness than those who perceived themselves as deprived. The effects were somewhat less pronounced for family relationships: There were significant, curvilinear, effects on three of the feelings. Individuals perceiving reciprocity in their family relationships reported more gratitude and pride and less sadness than those who perceived indebtedness, who, in turn reported more gratitude and satisfaction and less sadness than those who perceived deprivation. The effects were somewhat less strong than for friendships: There was a significant, curvilinear, effect on two of the feelings (in part due to the fact that relatively few people perceived a lack of reciprocity). Individuals perceiving reciprocity in their friendships reported more pride and less sadness than those who perceived indebtedness, who, in turn reported somewhat more pride and less sadness than those who perceived deprivation.

**Table 1:** Relationship between reciprocity and feelings

	Deprivation	Reciprocity	Indebtedness	<i>F</i>
<i>Partner</i>				
Gratitude	3.80 (1.64)	5.42 (.84)	5.00 (1.32)	(2.40) = 3.87*
Pride	4.20 (1.79)	5.26 (1.15)	4.50 (1.21)	(2.39) = 2.31
Satisfaction	4.00 (1.41)	5.48 (1.07)	5.06 (1.18)	(2.39) = 3.24*
Guilt	4.00 (1.58)	2.89 (1.13)	3.13 (1.02)	(2.38) = 1.83
Anger	4.33 (1.51)	2.94 (1.14)	2.75 (1.06)	(2.38) = 4.20*
Sadness	4.83 (1.60)	2.72 (1.23)	2.94 (1.29)	(2.39) = 6.13**
<i>Family</i>				
Gratitude	3.33 (1.03)	5.14 (1.02)	4.94 (1.18)	(2.57) = 7.38***
Pride	3.33 (.52)	4.94 (1.22)	4.43 (1.31)	(2.57) = 4.94*
Satisfaction	4.17 (.41)	5.22 (1.12)	4.88 (1.45)	(2.57) = 2.21
Guilt	3.33 (1.21)	2.68 (1.00)	3.31 (1.08)	(2.58) = 2.62
Anger	3.17 (1.17)	2.51 (.99)	2.63 (.96)	(2.58) = 1.11
Sadness	4.50 (.84)	2.59 (.96)	3.13 (1.41)	(2.58) = 8.28***
<i>Friends</i>				
Gratitude	4.18 (1.32)	5.03 (1.27)	5.00 (.82)	(2.56) = 2.05
Pride	3.72 (1.56)	4.82 (1.32)	3.86 (1.57)	(2.56) = 3.47*
Satisfaction	4.64 (1.36)	5.23 (1.27)	4.71 (1.11)	(2.56) = 1.23
Guilt	2.27 (.47)	2.55 (1.01)	3.00 (.82)	(2.57) = 1.35
Anger	2.72 (.79)	2.35 (.86)	2.00 (.00)	(2.57) = 1.85
Sadness	3.54 (1.21)	2.63 (1.07)	2.71 (.76)	(2.58) = 3.20*

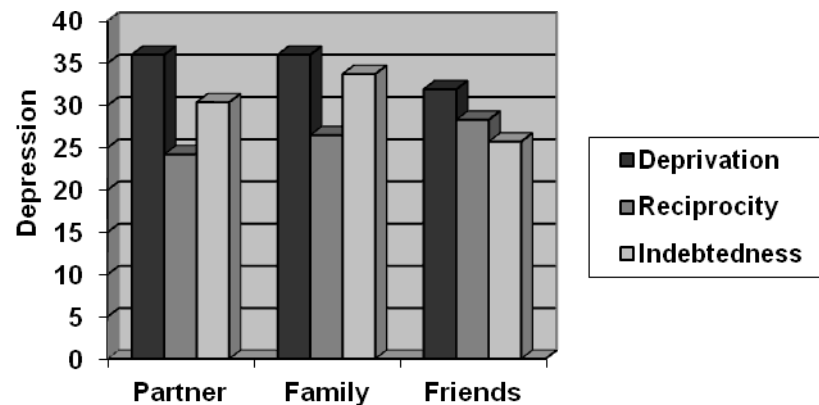
Note: \*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$

#### *Perceived Reciprocity and Depression*

To examine the relationship between reciprocity and depression, we executed ANOVAs with reciprocity in each of the relationships as the independent variable, and depression as the dependent variable. There was a marginally significant, curvilinear, effect of reciprocity in the relationship with the partner on depression,  $F(2, 43) = 3.01, p = .06$ , and a significant, curvilinear, effect of reciprocity in the relationship with family members on depression,  $F(2, 63) = 3.70, p = .03$ . As shown in Figure 1, those who perceived deprivation in the relationship with their partner as well as with their family reported the highest level of depression, followed by those who perceived indebtedness, who, in turn reported less depression than those perceiving reciprocity. Largely in line with our expectations, reciprocity in the relationships with friends was not related to depression,  $F(2, 61) = .71, p = .49$ .



**Figure 1:** Relationship between reciprocity and depression for three types of relationships



#### *Reciprocity Related Feelings and Depression*

Next we examined the association between reciprocity related feelings and depression. Preliminary analyses (not reported here) showed that all feelings were in general quite strongly associated with depression. Especially guilt in the relationship with the partner and with family members ( $r$ 's  $> .70$ ) was associated with depression, and sadness in all three relationships, as well as anger in the relationship with the partner and with family members, was associated highly with depression ( $r$ 's  $> .60$ ). We examined in a series of hierarchical regressions for each type of relationship separately which of the feelings had the strongest contribution to depression. For the relationship with the partner, guilt ( $\beta = .52$ ,  $t = 2.59$ ,  $p = .02$ ) was the only significant independent predictor of depression, with sadness ( $\beta = .36$ ,  $t = 1.71$ ,  $p = .10$ ) making a marginally significant independent contribution, for all other emotions  $|\beta|$ 's  $< .25$ ,  $t$ 's  $< 1.31$   $p$ 's  $> .20$ ). The amount of explained variance was substantial,  $R^2 = .63$ ,  $F(6, 36) = 8.36$ ,  $p < .01$ . Quite similar findings were obtained for the relationship with family members. In this type of relationship, guilt ( $\beta = .51$ ,  $t = 3.62$ ,  $p < .01$ ) was the only significant independent predictor of depression, for all other emotions  $|\beta|$ 's  $< .23$ ,  $t$ 's  $< 1.45$   $p$ 's  $> .12$ . The amount of explained variance was again substantial,  $R^2 = .61$ ,  $F(6, 55) = 12.55$ ,  $p < .01$ . For the relationships with friends, sadness ( $\beta = .51$ ,  $t = 3.34$ ,  $p < .01$ ) was the most important independent predictor of depression, with guilt ( $\beta = .31$ ,  $t = 2.62$ ,  $p = .05$ ) making an additional significant independent contribution, the other  $\beta$ 's being non-significant, and, as expected, considerably lower than for the other types of relationships ( $|\beta|$ 's  $< .05$ ,  $t$ 's  $< .31$ ,  $p$ 's  $> .75$ ). The amount of explained variance was somewhat less than for both other types of relationships,  $R^2 = .61$ ,  $F(6, 55) = 9.57$ ,  $p < .01$ .

#### **Discussion**

We examined the role of reciprocity in the relationships of people with SCI, a type of injury that may put someone in general in the position of being mainly the receiver of help without being able to do much in return. We were particularly interested in the question if, as is often assumed (e.g., Alexander, 1982), reciprocity would be more

important in friendships than in both other types of relationships. The results show a quite differentiated and intriguing picture with respect to this issue. In line with our expectations, and consistent with other research (e.g., Li et al., 2011), participants perceived more reciprocity in relationships with friends than in relationships with partner and family members. Our interpretation of this finding is that non-reciprocal friendships have a higher risk of being terminated than relationships with partner or family, possibly not because reciprocity is more important in friendships, but because there are usually more emotional and practical barriers to breaking up a partner or a family relationship than a friendship. Furthermore, while in relationships with friends, perceptions of indebtedness occurred as often as perceptions of deprivation, while in relationships with partner and family, perceptions of indebtedness were more prevalent than perceptions of deprivation. This confirms our idea that individuals with SCI might perceive their relationships as balanced in their favor. Nevertheless, remarkably, perceptions of deprivation did also occur regularly, maybe because individuals perceived that they did what they could for their partner, given the situation, but that their partner did not provide the help and support that would be appropriate given his or her healthy condition.

In general, as expected, our data suggest that perceptions of reciprocity may have the most impact on partner relationships, and the least impact on friendships. In partner relationships the degree of perceived reciprocity was more strongly associated with the various feelings than in both other types of relationships. As is generally found in this type of study, deprivation was somewhat more strongly associated with negative feelings than indebtedness. In addition, a lack of reciprocity in partner relationships, and especially in family relationships, was associated with depression; this was not the case for friendships, which is in line with Stewart-Williams (2007). Thus, whereas the prevalence of perceived reciprocity was higher in friendships than in partner and family relationships, a lack of perceived reciprocity in family and partner relationships tended to be more strongly associated with a low well-being.

The fact that reciprocity concerns are apparently important even among people with SCI underline the theoretical notion that the motivation to have and maintain reciprocal relationships is a very basic human feature that has ancient ancestral roots and pervades partner and family relationships (e.g., Buunk and Schaufeli, 1999; De Waal, 1996; Gintis et al., 2007). Moreover, although the term “family” will not only have included kin, our findings seem to qualify the idea that reciprocation is less important in kin relationships than in friendships (Stewart-Williams, 2007). Of course, we did only assess perceptions of individuals with SCI, and not of their partners and family members. However, there is evidence that partners of cancer patients feel more dissatisfied with their relationship when they perceive a lack of reciprocity, whether it is indebtedness or deprivation (Kuijer et al., 2001, 2002).

There are some potential limitations of the present research. First, this study was cross-sectional and descriptive, and does not pretend to make causal inferences. Second, the sample was relatively small, and may have been subject to a self-selection bias, leading to an over- or underestimation of the level of reciprocity. Moreover, due to the small sample size, the numbers in especially the deprived categories were rather small. Finally, we cannot tell on the basis of the present research why perceptions of reciprocity were

relatively prevalent in friendships. We suggest that this is because non-reciprocal friendships are likely to break up, but it may also be possible that friends tend to underestimate their gains and overestimate their costs. Nevertheless, the present findings are unique in their focus on the help-receiver in a situation of a limiting affliction, adding not only to the discussion on reciprocal altruism in different types of relationships, but also shedding light on the effect of being inflicted with SCI on one's interpersonal relationships. Our results can be useful for improving the well-being of people with SCI. In a practical sense, health care professionals should not only focus on physical rehabilitation, but should also prepare patients for the maintenance and improvement of reciprocity in their interpersonal relationships, and especially their partner relationships. Social skills training aimed at enhancing assertiveness could be useful as a communication tool to achieve balanced reciprocal relationships. Becoming more assertive may help people with SCI not only in preventing and reducing feelings of deprivation by communicating their desires to their partner, but also in preventing and reducing feelings of indebtedness by looking for ways in which they might assist their partner. In addition, emotional intelligence training might be appropriate to help people with SCI in coping with potential conflicts with their close others, and to help them in realizing that, as someone with a serious infliction, there is in itself nothing wrong with being more the receiver than provider of help. It is also important to care for the informal caregivers of people with SCI, not only to assist them in the daily coping, but also to help them in realizing the importance for balanced relationships of people with SCI.

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